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## The past:

Spacecraft were **large, expensive and time-consuming** to build. Once in orbit, they would follow set paths around the Earth. When disaster struck, we had to **hope a spacecraft would pass overhead** in time to provide an image.

## Today:

Spacecraft the **size of shoeboxes** are being built quickly and cheaply in the heart of Glasgow. This means we have **more spacecraft and more space data available** than ever before – but space is getting **crowded!**

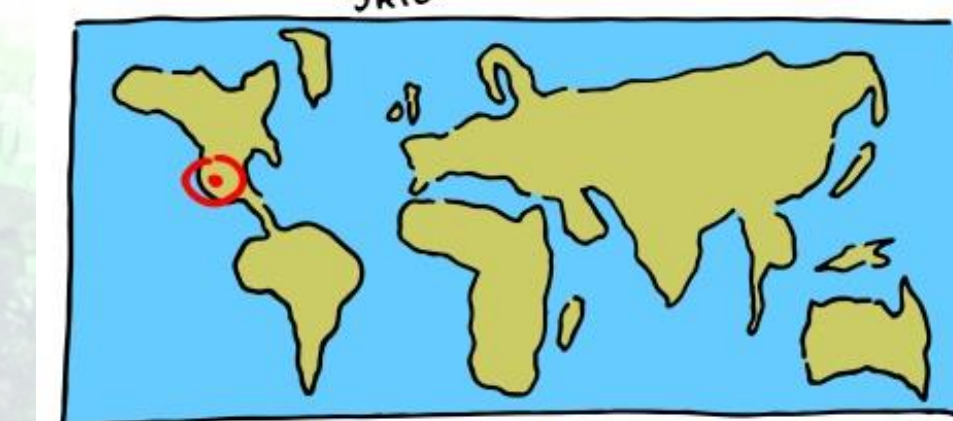
## The future:

**Small spacecraft** are light and agile and could be **manoeuvred** to provide coverage of urgent disasters, such as fires and storms, on demand. These responsive systems would let us have **on-demand data, without cluttering our space environment**. But, to enable this, we need to be able to **plan, orchestrate and operate manoeuvres across a constellation** of numerous spacecraft. *My work aims to enable this.*

SATELLITE DATA ON DEMAND  
DR. CIARA McGRATH

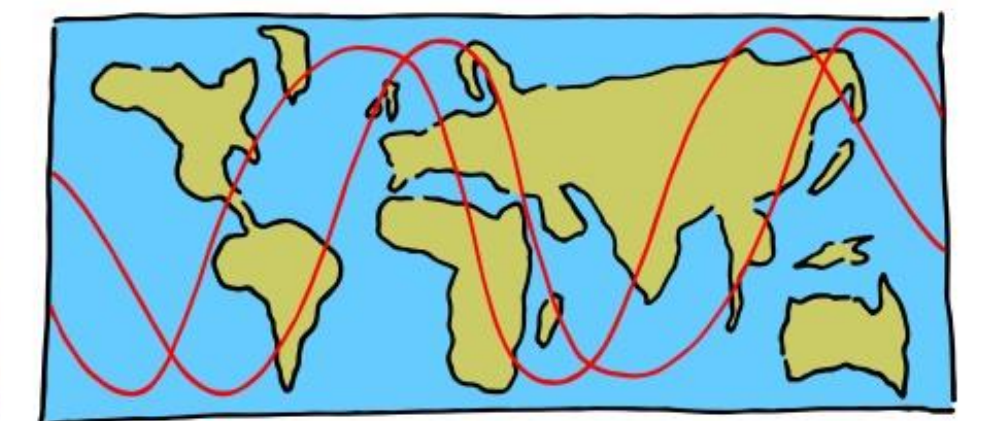


DIFFERENT SATELLITE ORBITS HAVE DIFFERENT ADVANTAGES AND DISADVANTAGES



GEOSYNCHRONOUS ORBIT

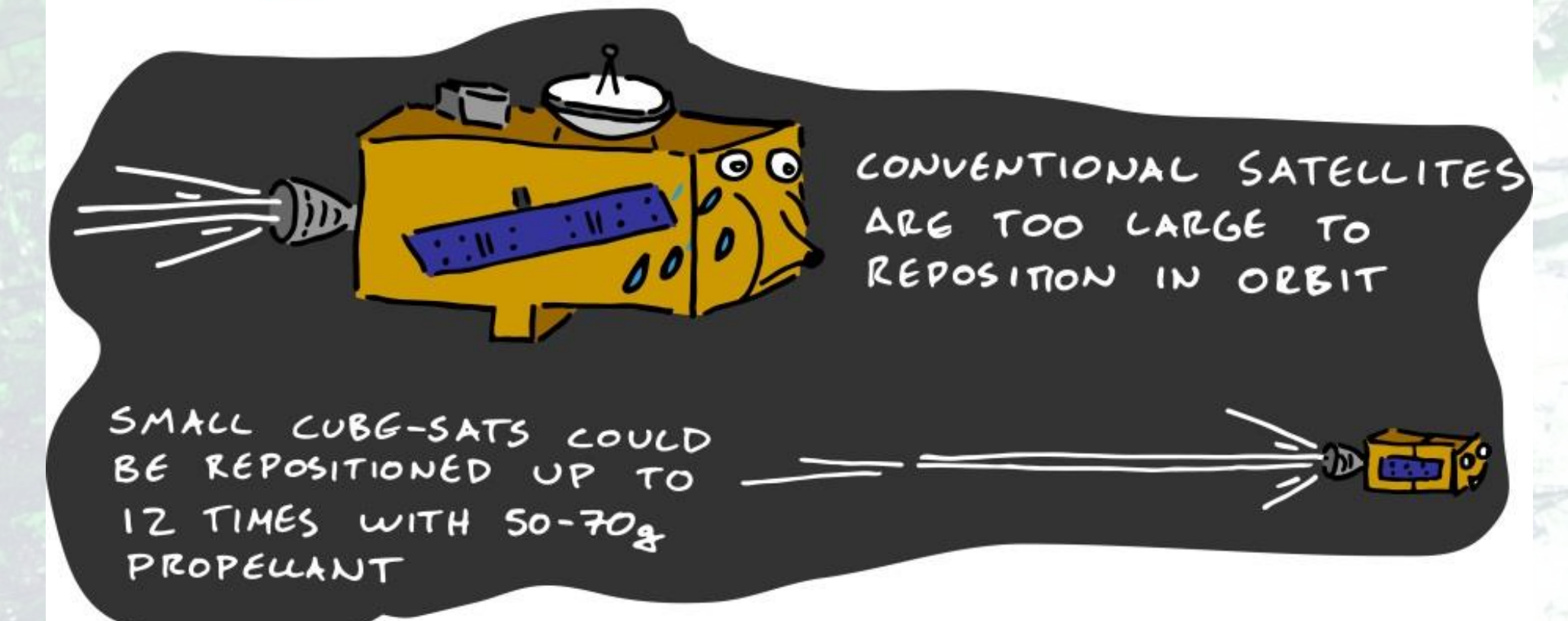
CONTINUOUS LOW  
RESOLUTION COVERAGE  
OF A LIMITED AREA



LOW POLAR ORBIT

HIGH RESOLUTION COVERAGE OF  
THE WHOLE PLANET, BUT ONLY  
PERIODICALLY FOR ANY PLACE

- ✓ TEMPORAL RESOLUTION
- ✗ SPATIAL RESOLUTION
- ✗ SPATIAL COVERAGE



CONSTELLATION OF 24 MANOEUVRABLE CUBE-SATS  
IN LOW EARTH ORBIT  
WOULD ALLOW RESPONSIVE OBSERVATIONS OF  
NATURAL DISASTERS AND INFRASTRUCTURE PROJECTS



FOREST FIRES



WIND FARMS

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